GT20A-B7040

Service Engineer's Manual

PREFACE

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Version 1.0

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Notice for the USA
Compliance Information Statement (Declaration of Conformity Procedure) DoC FCC Part 15: This device complies with part 15 of the FCC Rules

This device complies with Part 15 of the FCC Rules. Operation is subject to the following conditions:

- This device must not cause harmful interference.
- This device must accept any interference received, including interference that may cause undesirable operation.

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Notice for Canada

This Class A digital apparatus complies with Canadian ICES-003. Cet appareil numérique de la Classe A est conforme à la norme NMB-003 du Canada.

Notice for Europe (CE Mark)
This product is in conformity with the Council Directive 2004/108/EC.

CAUTION: Lithium battery included with this board. Do not puncture, mutilate, or dispose of battery in fire. There will be danger of explosion if battery is incorrectly replaced. Replace only with the same or equivalent type recommended by manufacturer. Dispose of used battery according to manufacturer instructions and in accordance with your local regulations.

About this Manual

This manual provides you with instructions on installing your TYAN GT20A-B7040. This Manual is intended for experienced users and integrators with hardware knowledge of personal computers.

This manual consists of the following parts:

Chapter 1:	Provides an introduction to the TYAN GT20A-B7040 barebones, standard parts list, describes the external components, gives a table of key components, and provides block diagram of the system.
Chapter 2:	Covers procedures on installing the CPU, memory modules and hard drives.
Chapter 3:	Covers removal and replacement procedures for pre-installed components.
Appendix:	List the Fan and Temp Sensors, Cable Connection Table and FRU Parts List for reference of system setup, and technical support in case a problem arises with your system.

Safety and Compliance Information

Before installing and using TYAN GT20A-B7040, take note of the following precautions:

- Read all instructions carefully.
- Do not place the unit on an unstable surface, cart, or stand.
- Do not block the slots and opening on the unit, which are provided for ventilation.
- Only use the power source indicated on the marking label. If you are not sure, contact the power company.
- The unit uses a three-wire ground cable, which is equipped with a third pin to ground the unit and prevent electric shock. Do not defeat the purpose of this pin. If your outlet does not support this kind of plug, contact your electrician to replace your obsolete outlet.
- Do not place anything on the power cord. Place the power cord where it will not be in the way of foot traffic.
- Follow all warnings and cautions in this manual and on the unit case.
- Do not push objects in the ventilation slots as they may touch high voltage components and result in shock and damage to the components.
- When replacing parts, ensure that you use parts specified by the manufacturer.
- When service or repairs have been done, perform routine safety checks to verify that the system is operating correctly.
- Avoid using the system near water, in direct sunlight, or near a heating device.
- Cover the unit when not in use.

Safety Information

Retain and follow all product safety and operating instructions provided with your equipment. In the event of a conflict between the instructions in this guide and the instructions in equipment documentation, follow the guidelines in the equipment documentation.

Observe all warnings on the product and in the operating instructions. To reduce the risk of bodily injury, electric shock, fire and damage to the equipment, observe all precautions included in this guide.

You must become familiar with the safety information in this guide before you install, operate, or service TYAN products.

Symbols on Equipment

	Caution. This symbol indicates a potential hazard. The potential for injury exists if cautions are not observed. Consult equipment documentation for specific details.
	Warning. This symbol indicates the presence of hazardous energy circuits or electric shock hazards. Refer all servicing to qualified personnel.
	Warning. This symbol indicates the presence of a hot surface or hot component. If this surface is contacted, the potential for injury exists. To reduce risk of injury from a hot component, allow the surface to cool before touching.

General Precautions

- Follow all caution and warning instructions marked on the equipment and explained in the accompanying equipment documentation.

Machine Room Environment

- Make sure that the area in which you install the system is properly ventilated and climate-controlled.

- Ensure that the voltage and frequency of your power source match the voltage and frequency inscribed on the electrical rating label of the equipment.
- Do not install the system in or near a plenum, air duct, radiator, or heat register.
- Never use the product in a wet location.

Equipment Chassis

- Do not block or cover the openings to the system.
- Never push objects of any kind through openings in the equipment. Dangerous voltages might be present.
- Conductive foreign objects can produce a short circuit and cause fire, electric shock, or damage to your equipment.
- Lift equipment using both hands and with your knees bent.

Equipment Racks

To avoid injury or damage to the equipment:

- Observe local occupational health and safety requirements and guidelines for manual materials handling.
- Do not attempt to move a rack by yourself; a minimum of two people are needed to move a rack.
- Do not attempt to move a fully loaded rack. Remove equipment from the rack before moving it.
- Do not attempt to move a rack on an incline that is greater than 10 degrees from the horizontal.
- Make sure the rack is properly secured to the floor or ceiling.
- Make sure the stabilizing feet are attached to the rack if it is a single-rack installation.
- Make sure racks are coupled together if it is a multiple-rack installation.
- Make sure the rack is level and stable before installing an appliance in the rack.
- Make sure the leveling jacks are extended to the floor.

- Make sure the full weight of the rack rests on the leveling jacks.
- Always load the rack from the bottom up. Load the heaviest component in the rack first.
- Make sure the rack is level and stable before pulling a component out of the rack.
- Make sure only one component is extended at a time. A rack might become unstable if more than one component is extended.

To avoid damage to the equipment:

- The rack width and depth must allow for proper serviceability and cable management.
- Ensure that there is adequate airflow in the rack. Improper installation or restricted airflow can damage the equipment.
- The rack cannot have solid or restricted airflow doors. You must use a mesh door on the front and back of the rack or remove the doors to ensure adequate air flow to the system.
- If you install the Model in a rack, do not place equipment on top of the unit. It will cause restricted airflow and might cause damage to the equipment.
- Make sure the product is properly matted with the rails. Products that are improperly matted with the rails might be unstable.
- Verify that the AC power supply branch circuit that provides power to the rack is not overloaded. This will reduce the risk of personal injury, fire, or damage to the equipment. The total rack load should not exceed 80 percent of the branch circuit rating. Consult the electrical authority having jurisdiction over your facility wiring and installation requirements.

Equipment Power Cords

- Use only the power cords and power supply units provided with your system. The system might have one or more power cords.
- Plug the power cord into a grounded (earthed) electrical outlet that is easily accessible at all times.
- In all European electrical environments, you must ground the Green/Yellow tab on the power cord. If you do not ground the

Green/Yellow tab, it can cause an electrical shock due to high leakage currents.

• Do not place objects on AC power cords or cables. Arrange them so that no one might accidentally step on or trip over them.

• Do not pull on a cord or cable. When unplugging from the electrical outlet, grasp the cord by the plug.

• To reduce the risk of electrical shock, disconnect all power cords before servicing the appliance.

Equipment Batteries

• The system battery contains lithium manganese dioxide. If the battery pack is not handled properly, there is risk of fire and burns.

• Do not disassemble, crush, puncture, short external contacts, or dispose of the battery in fire or water.

• Do not expose the battery to temperatures higher than 60°C (140°F).

• The system battery is not replaceable. If the battery is replaced by an incorrect type, there is danger of explosion. Replace the battery only with a spare designated for your product.

• Do not attempt to recharge the battery.

• Dispose of used batteries according to the instructions of the manufacturer. Do not dispose of batteries with the general household waste. To forward them to recycling or proper disposal, use the public collection system or return them to TYAN, your authorized TYAN partner, or their agents.

Equipment Modifications

• Do not make mechanical modifications to the system. TYAN is not responsible for the regulatory compliance of TYAN equipment that has been modified.

Equipment Repairs and Servicing

• The installation of internal options and routine maintenance and service of this product should be performed by individuals who are knowledgeable about the procedures, precautions, and hazards associated with

equipment containing hazardous energy levels.

- Do not exceed the level of repair specified in the procedures in the product documentation. Improper repairs can create a safety hazard.

- Allow the product to cool before removing covers and touching internal components.

- Remove all watches, rings, or loose jewelry when working before removing covers and touching internal components.

- Do not use conductive tools that could bridge live parts.

- Use gloves when you remove or replace system components; they can become hot to the touch.

- If the product sustains damage requiring service, disconnect the product from the AC electrical outlet and refer servicing to an authorized service provider. Examples of damage requiring service include:

– The power cord, extension cord, or plug has been damaged.

– Liquid has been spilled on the product or an object has fallen into the product.

– The product has been exposed to rain or water.

– The product has been dropped or damaged.

– The product does not operate normally when you follow the operating instructions.

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Chapter 1: Overview

1.1 About the TYAN GT20A-B7040

Congratulations on your purchase of the TYAN® GT20A-B7040, a highly optimized rack-mountable barebone system. The GT20A-B7040 is designed to support dual Intel® Xeon E5-2400 Series processors and up to 288GB of LRDIMM / 144GB of RDIMM / 72GB of UDIMM DDR3 memory. Leveraging advanced technology from Intel®, GT20A-B7040 server system is capable of offering scalable 32 and 64-bit computing, high bandwidth memory design, and lightning-fast PCI-E bus implementation.

The GT20A-B7040 not only empowers your company in nowadays IT demand but also offers a smooth path for future application usage.

TYAN® is also proud to deliver the GT20A-B7040 in a version that can support up to four 3.5" hot-swap hard drives. The GT20A-B7040 uses TYAN®'s latest chassis featuring a robust structure and a solid mechanical enclosure. All of this provides GT20A-B7040 the power and flexibility to meet the needs of nowadays server application.

1.2 Product Model

Model	HDD Bays	Power supply
GT20A-B7040	Hot-swap, 4 HDDs	(1) 500 Watts (80 plus gold)

1.3 Features

TYAN GT20AB7040 (B7040G20AV4H)

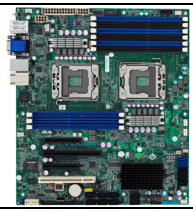
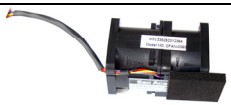
System	Form Factor	1U Rackmount
	Gross Weight	17 kg
	Chassis Model	GT20A
	Dimension (D x W x H)	24.6" x 17.2" x 1.72" (625.4 x 436 x 43.6mm)
	Motherboard	S7040GM2NR-1U-B
	Board Dimension	CEB, 12"x10.5" (305x267mm)
Front Panel	Buttons	(1) PWR / (1) RST / (1) NMI / (1) ID
	LEDs	(1) HDD / (2) LAN / (1) ID / (1) Warning
	I/O Ports	(2) USB ports
External Drive Bay	Type / Q'ty	2.5" or 3.5" Hot-Swap / (4)
	HDD backplane support	SAS / SATA 6.0Gb/s
System Cooling Configuration	FAN	(4) 4028 + (1) 4056 fans
Power Supply	Type	EPS1U
	Efficiency	80 plus gold
	Input Range	100-127V/8A / 200-240V/4A
	Frequency	50/60 Hertz
	Output Watts	500 Watts
Processor	Supported CPU Series	Intel Xeon Processor E5-2400 Series
	Socket Type / Q'ty	LGA1356 / (2)
	Thermal Design Power (TDP) wattage	Max up to 95W
	System Bus	Up to 8.0/ 7.2/ 6.4 GT/s with Intel QuickPath Interconnect (QPI) support
Chipset	PCH	Intel C602
Memory	Supported DIMM Qty	(6)+(3) DIMM slots
	DIMM Type / Speed	RDIMM ECC 1600/1333/1066 / UDIMM/LRDIMM ECC 1333/1066
	Capacity	up to 288GB LRDIMM / 144GB RDIMM / 72GB UDIMM
	Memory channel	3 Channels per CPU / Support 2 R/LR-DIMMs or 2 UDIMMs per channel (CPU 0) / Support 1 R/LR-DIMMs or 1 UDIMMs per channel (CPU 1)
	Memory voltage	1.5V or 1.35V
Expansion Slots	Recommended TYAN Riser Card	M2210-L8-1F, PCI-E Gen3 x8 slot (left)
LAN	Port Q'ty	(2) GbE ports

	Controller	Intel 82574L
Graphic	**Connector type**	D-Sub 15-pin
	Chipset	Aspeed AST2300
I/O Ports	**USB**	(4) ports
	COM	(1) DB-9 COM port
	VGA	(1) D-Sub 15-pin port
	RJ-45	(2) ports
System Monitoring	**Chipset**	Aspeed AST2300
	Voltage	Monitors voltage for CPU, memory, chipset & power supply
	Temperature	Monitors temperature for CPU & memory
	LED	Over temperature warning indicator / Fan & PSU fail LED indicator
	Others	Watchdog timer support
Server Management	**Onboard Chipset**	Onboard Aspeed AST2300
	AST2300 IPMI Feature	IPMI 2.0 compliant baseboard management controller (BMC) / Supports storage over IP and remote platform-flash / USB 2.0 virtual hub
	AST2300 iKVM Feature	24-bit high quality video compression / 10/100/1000 Mb/s MAC interface
BIOS	**Brand / ROM size**	AMI / 8MB
	Feature	Plug and Play (PnP) /PCI2.3 /WfM2.0 /SMBIOS2.3 /PXE boot / ACPI 2.0 power management /Power on mode after power recovery / User-configurable H/W monitoring / Auto-configurable of hard disk types
Operating System	**OS supported list**	Please visit our web site for the latest update.
Regulation	**FCC (DoC)**	Class A
	CE (DoC)	Yes
Operating Environment	**Operating Temp.**	10° C ~ 35° C (50° F~ 95° F)
	Non-operating Temp.	- 40° C ~ 70° C (-40° F ~ 158° F)
	In/Non-operating Humidity	90%, non-condensing at 35° C
RoHS	**RoHS 5/6 Compliant**	Yes
Package Contains	**Barebone**	(1) GT20AB7040 Barebone
	Manual	(1) User's manual
	Installation CD	(1) TYAN installation CD

1.4 Standard Parts List

This section describes the GT20A-B7040 package contents and accessories. Open the box carefully and ensure that all components are present and undamaged. The product should arrive packaged as illustrated below.

1.4.1 Box Contents

Component	Description
	1U chassis, (4) hot swap HDD bays
	TYAN® S7040 system board (pre-installed)
	(1)500 Watts single Power Supply (pre-installed)
	(1) 40x56mm System FAN (pre-installed)
	(4) 40x28mm System FAN (pre-installed)
	M1235 SATA/SAS HDD Backplane (pre-installed)
	M2210-L8-1F PCI-E Riser Card (pre-installed)
	M1008 LED control board (pre-installed)

1.4.2 Accessories

If any items are missing or appear damaged, contact your retailer or browse to TYAN®'s website for service: http://www.tyan.com
The web site also provides information of other TYAN® products, as well as FAQs, compatibility lists, BIOS settings, etc.

TYAN® Motherboard Drive CD

Heatsink x 1

AC Power Cord 125V (US) x 1

AC Power Cord 250V (EU) x 1

HDD Screws x 2

Mounting Ears & Screws

DVD Bracket Kit

Rack Mounting Kit

1.5 About the Product

The following views show you the product.

1.5.1 System Front View

Image-1

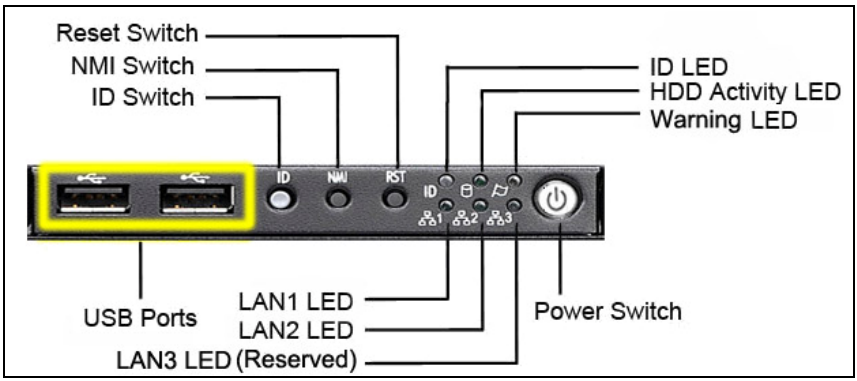
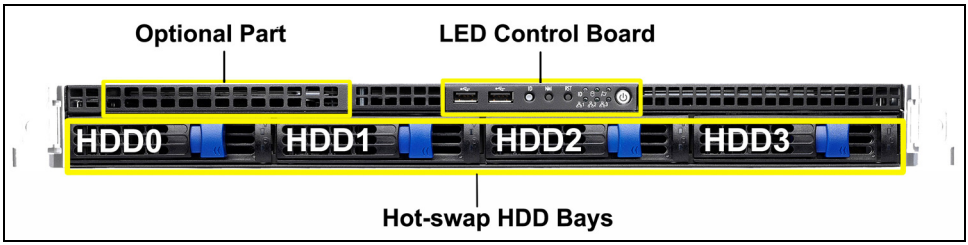


Image-2

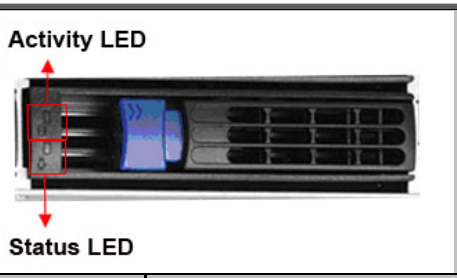


1.5.2 LED control and HDD LED Definitions

Table-1

LED	State	LED Color	Behavior	NOTE
Power	Power On	Green	Solid On	
	Power Off	Green	Off	
Warning	System normal	Amber	Off	BMC & HWM alert even
	System alert	Amber	Solid On	
HDD	HDD Ready	Green	Off	
	HDD Access	Green	Blinking	If one of HDD access then LED blinking
ID	ID located	Blue	Solid On	
	ID free	Blue	Off	
LAN1	Access	Green	Blinking	
	Link	Green	Solid On	
	Off Link	Green	Off	
LAN2	Access	Green	Blinking	
	Link	Green	Solid On	
	Off Link	Green	Off	

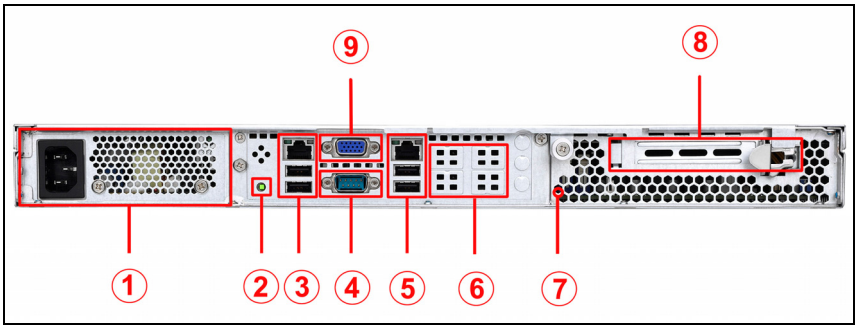
Table-2

State	

Activity LED Color: Green	Status LED Color: Red	Description
On	Off	Drive present,no activity
Green (Blinking)	Off	Drive present,with activity
Off	On	HDD Fail
Blink	Blinking @4Hz	Identify
Blink	Blinking @1Hz	Rebuilding

1.5.3 System Rear View

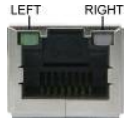
Image-3



NO.	Description
1	500W Power Supply
2	ID LED Button
3	LAN2 + 2 USB Stack (1RJ45+2USB) 100/1000 GbE LAN port)
4	Serial Port
5	LAN1(shared with IPMI)+2USB Stack (1RJ45+2USB) 100/1000 GbE LAN port)
6	LAN port location (Reserved)
7	ID LED
8	Expansion Slot
9	VGA Port

1.5.4 LAN and ID LED Definitions

Table-3

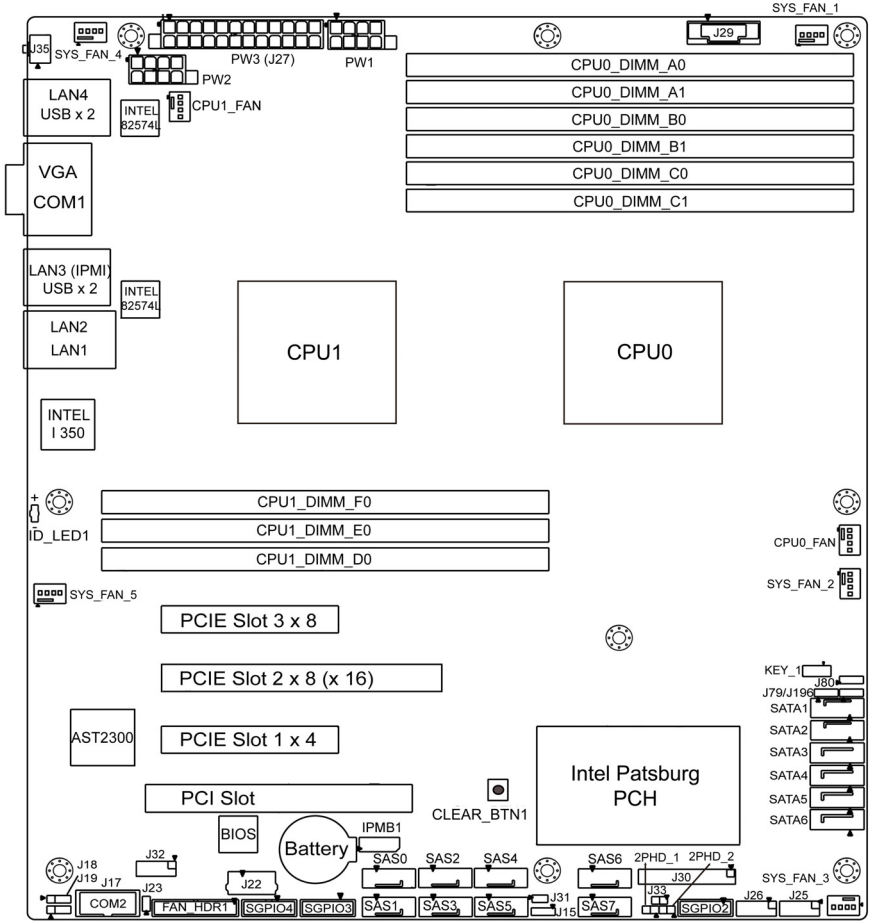
10/100/1000 Mbps LAN Link/Activity LED Scheme			
		**Left LED (Link/Activity)**	**Right LED (Speed)**
No Link		OFF	OFF
10 Mbps	**Link**	Solid Green	Solid Green
	Active	Blinking Green	Solid Green
100 Mbps	**Link**	Solid Green	Solid Green
	Active	Blinking Green	Solid Green
1000 Mbps (1Gbps)	**Link**	Solid Green	Solid Yellow
	Active	Blinking Green	Solid Yellow

NOTE: "Left" and "Right" are viewed from the rear panel.

ID LED

LED	Status	LED Color	Behavior	Remark
ID LED	Normal	Blue	Off	
	Located		Solid on	Local and remote

1.5.5 Motherboard (S7040) layout



Important NOTES to the User

"▲" indicates the location of "Pin 1". Jumpers not indicated are for testing only.

In your **B7040G20AV4H** barebone that LAN1 & LAN2 and chipset I350 have been removed on the S7040 motherboard.

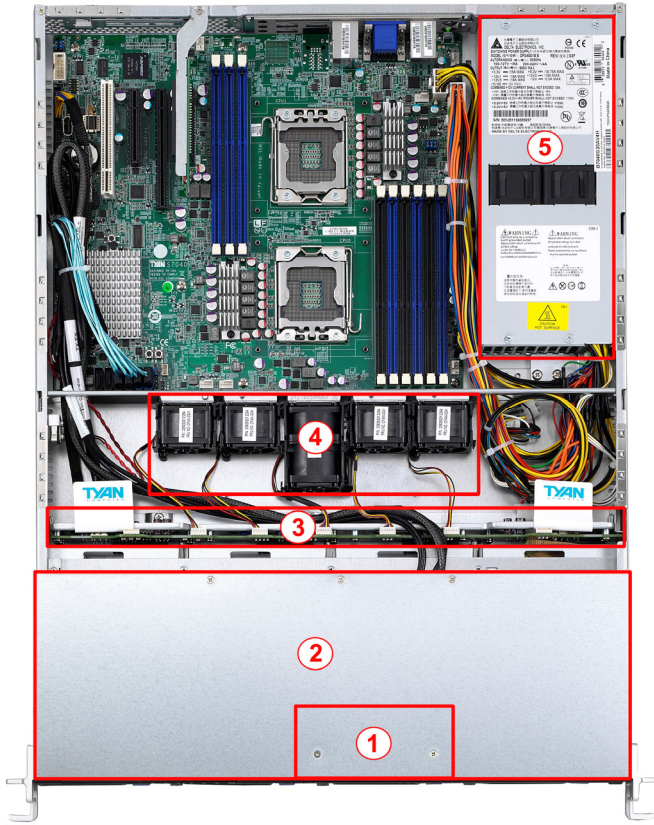
Jumpers & Connectors

Jumper/Connector	Function
CPU0_FAN/CPU1_FAN/ SYS_FAN_1/2/3/4/5	4-pin Fan Connector
J15	BIOS Recovery Mode Jumper
J17	COM2 Header
J18/J19	COM Port Select Jumper
J22	Vertical Type-A USB Connector
J23	BMC Reset Jumper
J25/J26	USB Front Panel Connector
J29	PSMI Pin Header
J30	Front Panel Connector
J31	Front Panel ID LED
J32	Port 80 Debug Pin Header
J33	Chassis Intrusion Header
J35	ID LED Switch Button
J79	ME Recovery Mode Jumper
J80	SMBUS HOST Pin Header
J196	MFG Jumper (reserved for ME F/W upgrade)
CLEAR_BTN1	Clear CMOS Reset Button
FAN_HDR1	Fan Connector Reserved for Barebone
IPMB1	IPMB Pin Header
KEY_1	Patsburg Upgrade ROM Module Header
SATA1/SATA2	SATA3.0 Connector
SATA3/4/5/6	SATA2.0 Connector
SGPIO2/SGPIO3/SGPIO4	PCH SGPIO Pin Header (reserved for barebone)
2PHD_1/2PHD_2	I350 LAN LED

Jumper Legend

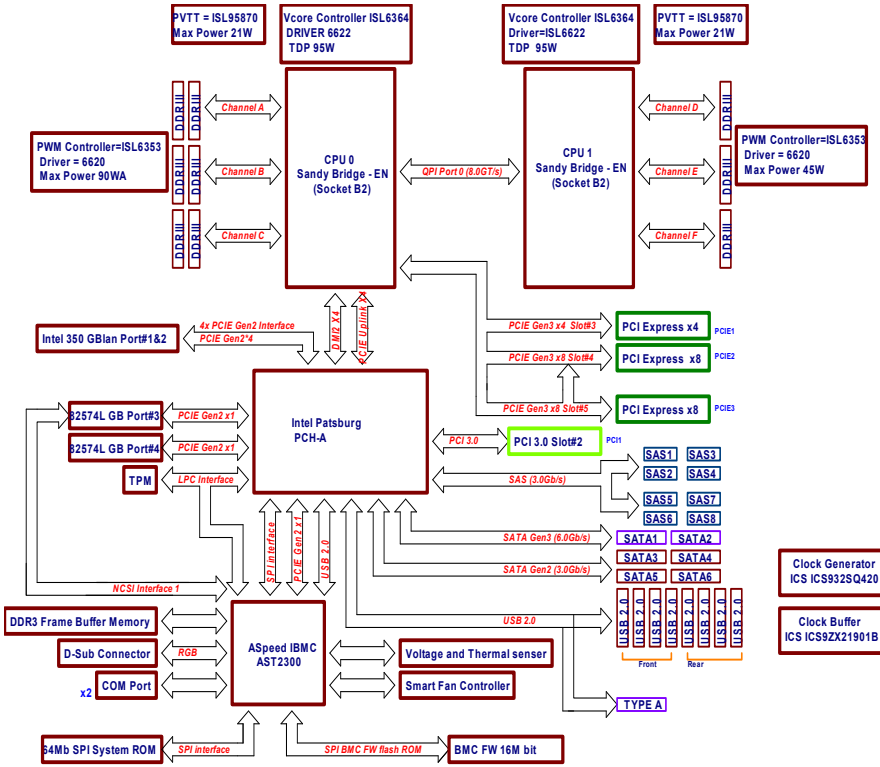
	OPEN - Jumper OFF	Without jumper cover
	CLOSED - Jumper ON	With jumper cover

1.5.6 System top view



Number	Description
1	LED Control Board
2	HDD Cage
3	HDD backplane Board
4	System Fan
5	Power Supply

1.5.7 Block Diagram



Chapter 2: Setting Up

2.0.1 Before you Begin

This chapter explains how to install the CPUs, CPU heatsinks, memory modules, and hard drives. Instructions on inserting add-on cards are also given.

2.0.2 Work Area

Make sure you have a stable, clean working environment. Dust and dirt can get into components and cause malfunctions. Use containers to keep small components separated. Putting all small components in separate containers prevents them from becoming lost. Adequate lighting and proper tools can prevent you from accidentally damaging the internal components.

2.0.3 Tools

The following procedures require only a few tools, including the following:

- A cross head (Phillips) screwdriver
- A grounding strap or an anti-static pad

Most of the electrical and mechanical connections can be disconnected with your hands. It is recommended that you do not use pliers to remove connectors as it may damage the soft metal or plastic parts of the connectors.

Caution!

1. To avoid damaging the motherboard and associated components, do not use torque force greater than 7kgf/cm (6.09 lb/in) on each mounting screw for motherboard installation.
2. Do not apply power to the board if it has been damaged.

2.0.4 Precautions

Components and electronic circuit boards can be damaged by discharges of static electricity. Working on a system that is connected to a power supply can be extremely dangerous. Follow the guidelines below to avoid damage to GT20A-B7040 or injury to yourself.

- Ground yourself properly before removing the top cover of the system. Unplug the power from the power supply and then touch a safely grounded object to release static charge (i.e. power supply case). If available, wear a grounded wrist strap. Alternatively, discharge any static electricity by touching the bare metal chassis of the unit case, or the bare metal body of any other grounded appliance.

- Avoid touching motherboard components, IC chips, connectors, memory modules, and leads.

- The motherboard is pre-installed in the system. When removing the motherboard, always place it on a grounded anti-static surface until you are ready to reinstall it.

- Hold electronic circuit boards by the edges only. Do not touch the components on the board unless it is necessary to do so. Do not flex or stress circuit boards.

- Leave all components inside the static-proof packaging that they ship with until they are ready for installation.

- After replacing optional devices, make sure all screws, springs, or other small parts are in place and are not left loose inside the case. Metallic parts or metal flakes can cause electrical shorts.

Note:

All connectors are keyed to only attach one way.

All use the correct screw size as indicated in the procedures.

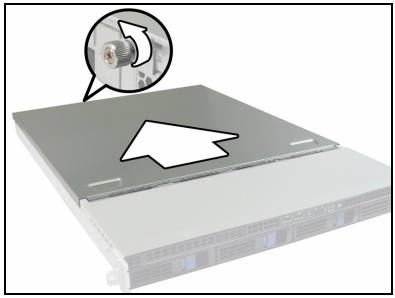
2.1 Installing Motherboard Components

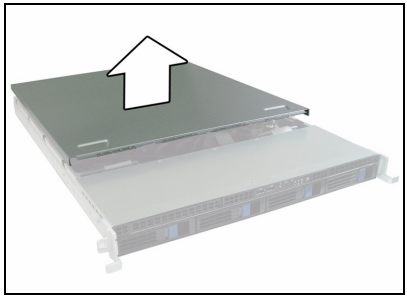
This section describes how to install components on to the mainboard, including CPUs, memory modules, HDD and add on cards.

2.2.1 Removing the Chassis Cover

Follow these instructions to remove the GT20A-B7040 chassis cover.

1. Release the screw on the back side. Then slide the chassis cover in the direction of arrow.





2. Located the chassis as the cover has been removed.

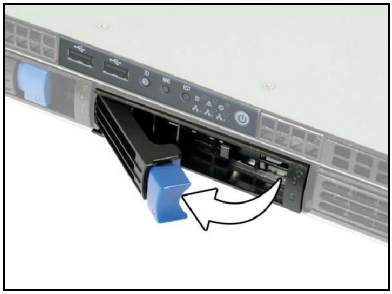
2.1.1 Installing Hard Drives

The GT20A-B7040 barebone supports (4) 3.5” and 2.5” hard trays. Follow these instructions to install a hard drive into the hard tray.

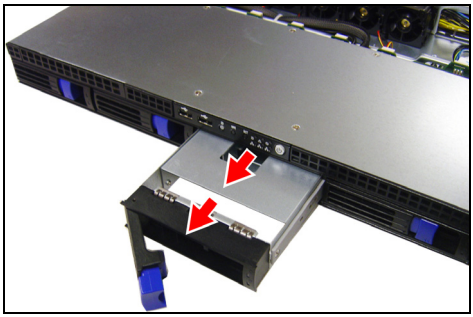
Warning!!!
Always install the hard disk drive to the chassis after the chassis is secured on the rack.

1. Press the locking lever latch in the direction of arrow (A) and then pull the locking lever open (B).

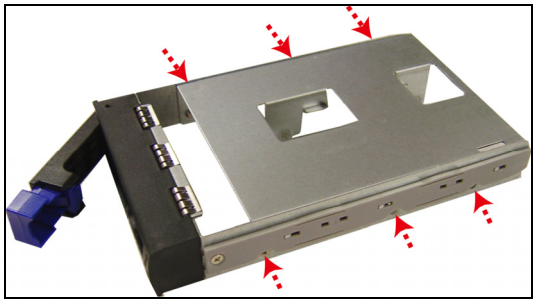
A **B**



2. Slide the drive tray out.

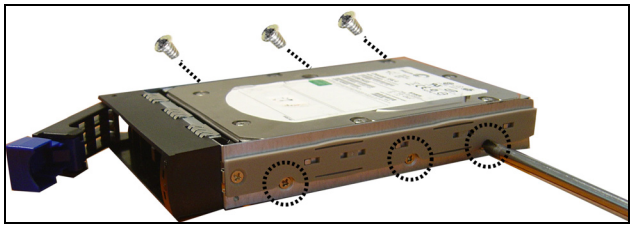


3. Unscrew the six screws as shown.



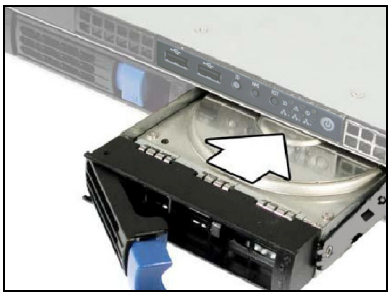
4. Place a hard drive into the drive tray.

5. Use 6 HDD screws to secure the HDD.



6. Reinsert the drive tray into the chassis (A), Press the locking lever to secure the hard drive. (B)

A **B**



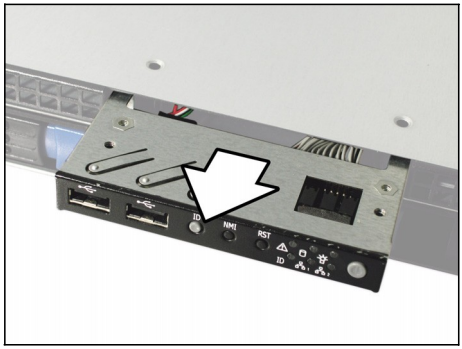
7. Repeat the same procedures to install other HDD trays.

2.1.2 Replacing the LED Control Board

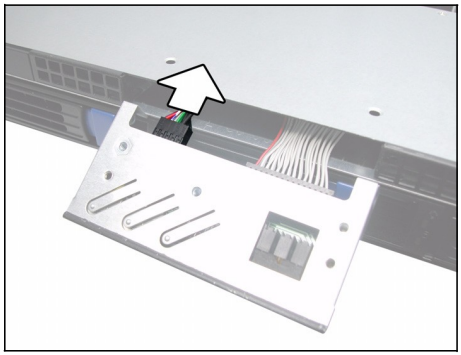
Follow these instructions to remove the LED control board.

1. Remove the 2 screws securing the LED control board to the chassis.

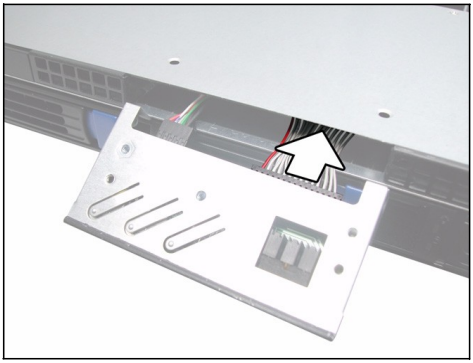
2. Pull the LED control board free from the chassis as shown below.



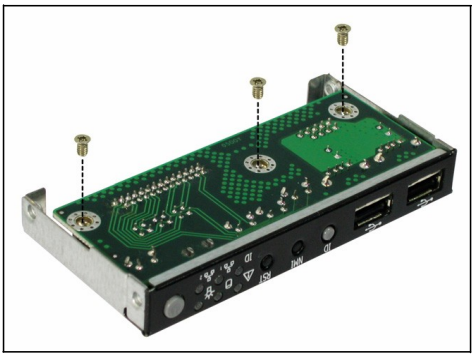
3. Unplug the USB cable from the connector.



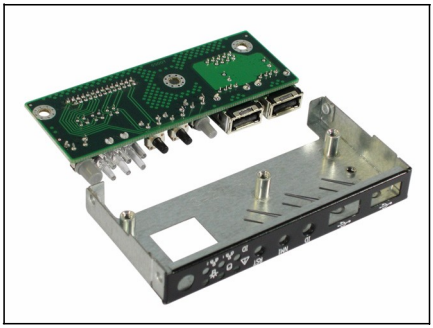
4. Unplug the front panel ribbon cable from the connector.



5. Remove the three screws securing the LED control board to the bracket



6. Release the LED control board from the bracket. After replacement, insert and secure the unit to the chassis following the reverse procedures from step 1~5.

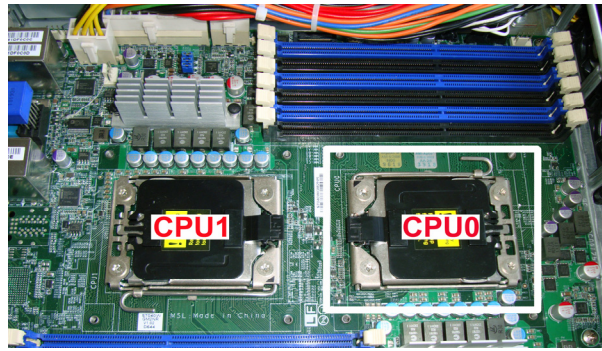


2.1.2 Installing the CPU and Heatsink

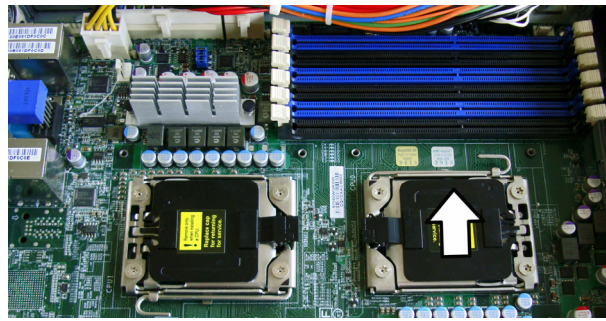
Follow the steps below to install the processor and heatsink.

Install the CPU

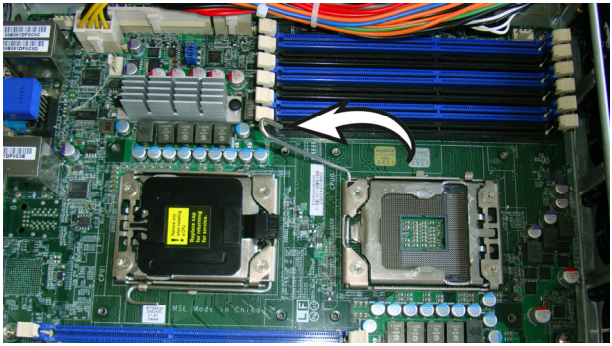
1. Locate the CPU socket.



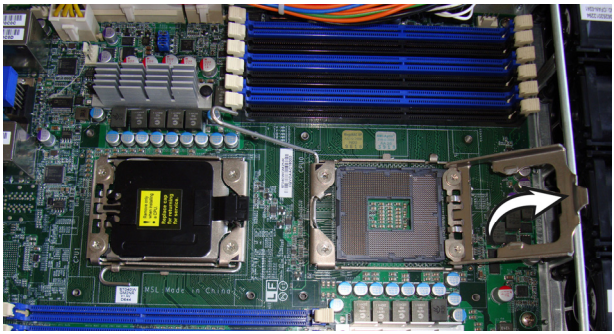
2. Take off the CPU Socket protection cap.



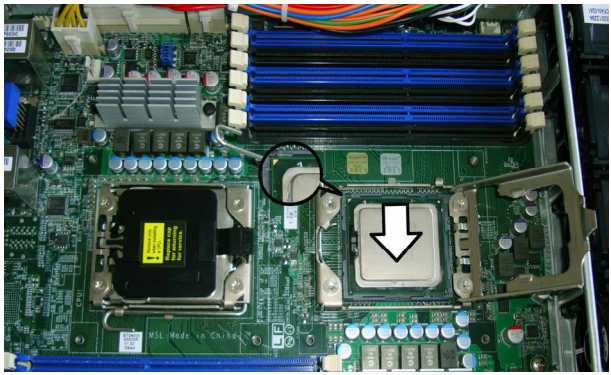
3. Pull the CPU lever up to unlock the CPU socket.



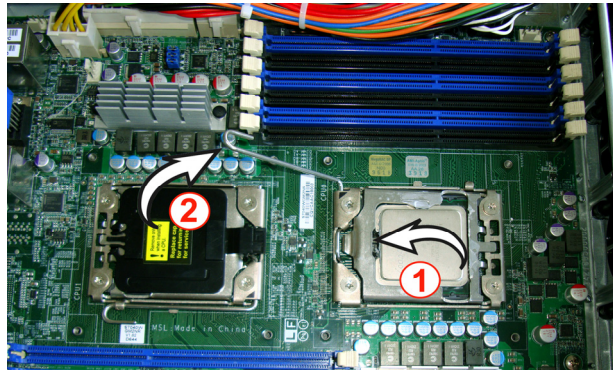
4. Open the socket to a fully open position.

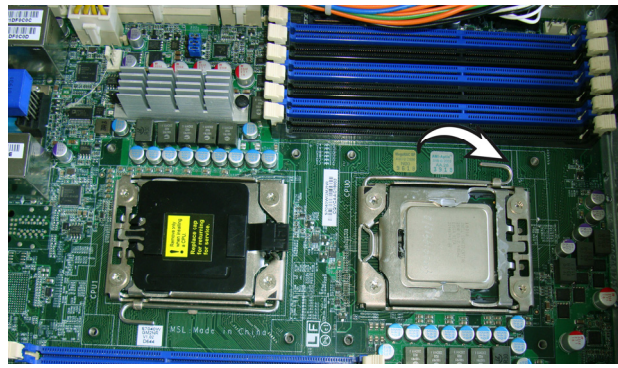


5. Place the CPU in the CPU socket. Make sure the gold arrow is located in the right direction.



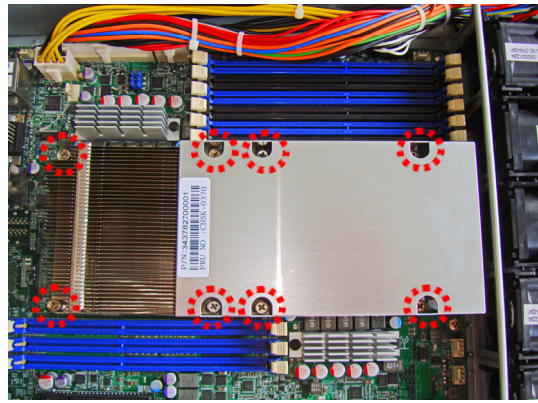
6. Close the socket and press the CPU socket lever down to secure the CPU.



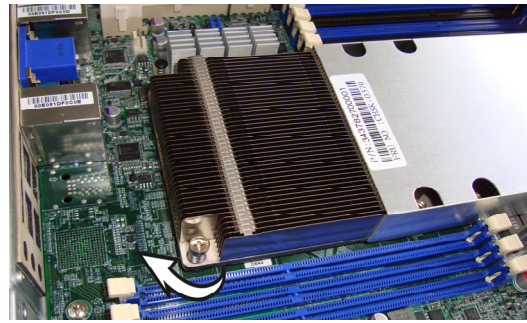


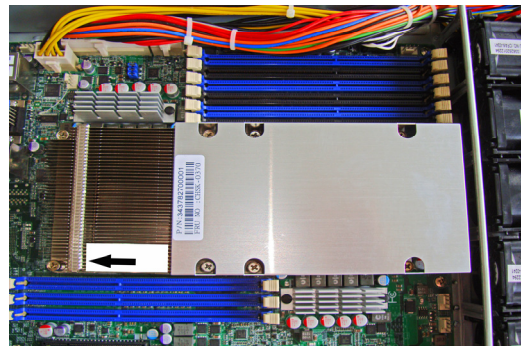
Install the heatsink

1. Place the heatsink on top of the CPU and secure it with 8 screws.



2. Secure the heatsink in the direction of the picture shown.

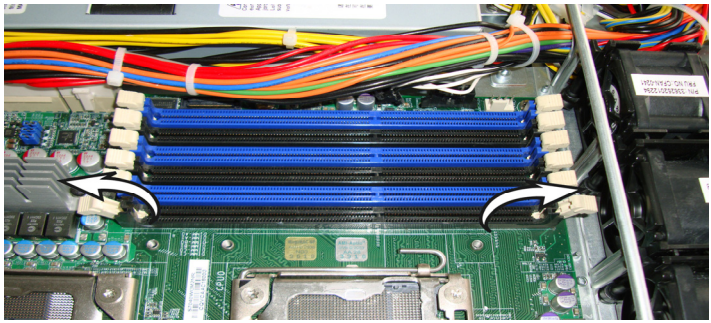




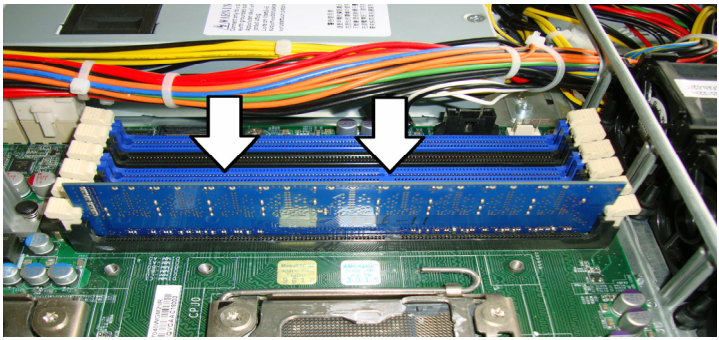
2.1.3 Installing the Memory

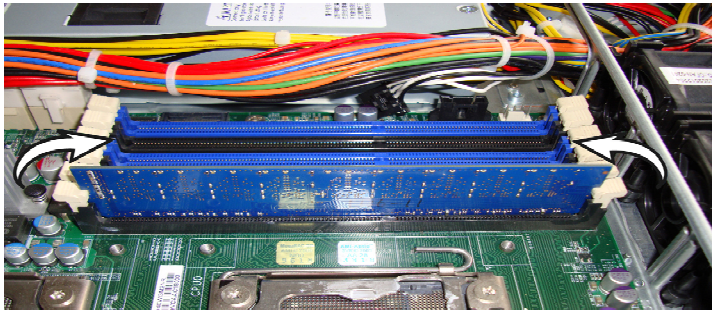
Follow these instructions to install the memory modules onto the motherboard.

1. Press the memory slot locking levers in the direction of the arrows as shown in the following illustration.

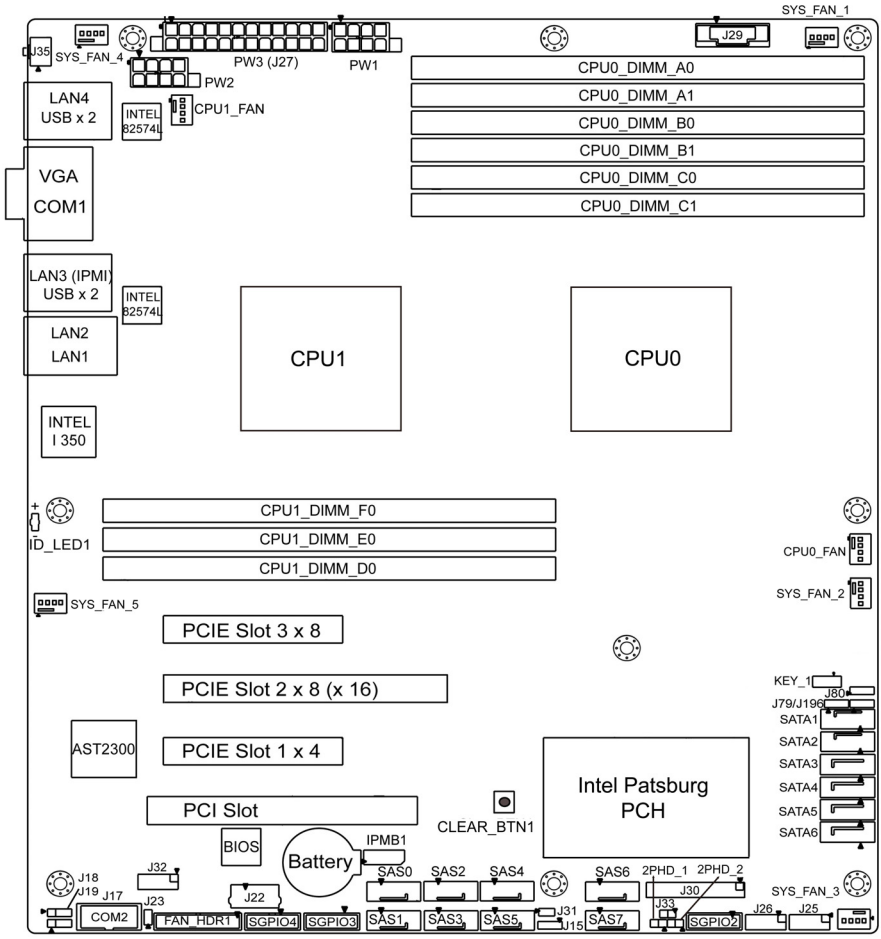


2. Align the memory module with the slot. When inserted properly, the memory slot locking levers lock automatically onto the indentations at the ends of the module.





Recommended Memory Population Table



NOTE:

In your **B7040G20AV4H** barebone that LAN1 & LAN2 and chipset I350 have been removed on the S7040 motherboard.

	Single CPU Installed (CPU0 only)						Dual CPU installed (CPU0 and CPU1)								
Quantity of memory installed	**1**	**2**	**3**	**4**	**5**	**6**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**
CPU0_DIMM_C1						√									√
CPU0_DIMM_C0			√	√	√	√					√	√	√	√	√
CPU0_DIMM_B1					√	√								√	√
CPU0_DIMM_B0		√	√	√	√	√			√	√	√	√	√	√	√
CPU0_DIMM_A1				√	√	√							√	√	√
CPU0_DIMM_A0	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
CPU1_DIMM_C1															
CPU1_DIMM_C0												√	√	√	√
CPU1_DIMM_B1															
CPU1_DIMM_B0										√	√	√	√	√	√
CPU1_DIMM_A1															
CPU1_DIMM_A0								√	√	√	√	√	√	√	√

NOTE:

1. √ indicates a populated DIMM slot.
2. Paired memory installation for Max performance.
3. Populate the same DIMM type in each channel, specifically.
   - Use the same DIMM size.
   - Use the same # of ranks per DIMM.
4. Dual-rank DIMMs are recommended over single-rank DIMMs
5. Un-buffered DIMM can offer slightly better performance than registerd DIMM if populating only a single DIMM per channel.
6. We don't suggest other memory installation.

U-DIMM Module Support

Ranks per DIMM & Data width	1DPC (DIMM Per Channel)		2DPC (DIMM Per Channel)	
	1.35V	**1.5V**	**1.35V**	**1.5V**
SRx8 Non-ECC	n/a	1066, 1333	n/a	1066
DRx8 Non-ECC	n/a	1066, 1333	n/a	1066
SRx16 Non-ECC	n/a	1066, 1333	n/a	1066
SRx8 ECC	1066, 1333	1066, 1333	1066	1066
DRx8 ECC	1066, 1333	1066, 1333	1066	1066

R-DIMM Module Support

Ranks per DIMM & Data width	1DPC (DIMM Per Channel)		2DPC (DIMM Per Channel)	
	1.35V	**1.5V**	**1.35V**	**1.5V**
SRx8	1066, 1333	1066, 1333, 1600	1066, 1333	1066, 1333, 1600
DRx8	1066, 1333	1066, 1333, 1600	1066, 1333	1066, 1333, 1600
SRx4	1066, 1333	1066, 1333, 1600	1066, 1333	1066, 1333, 1600
DRx4	1066, 1333	1066, 1333, 1600	1066, 1333	1066, 1333, 1600
QR x4	800	800	800	800
QR x8	800	800	800	800

LRDIMM Module Support

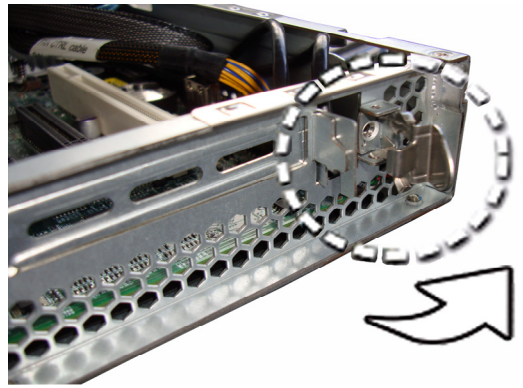
Ranks per DIMM & Data width	1DPC (DIMM Per Channel)		2DPC (DIMM Per Channel)	
	1.35V	**1.5V**	**1.35V**	**1.5V**
SRx8	1066	1066, 1333	1066	1066
DRx8	1066	1066, 1333	1066	1066

2.1.4 Installing the PCI-E Card

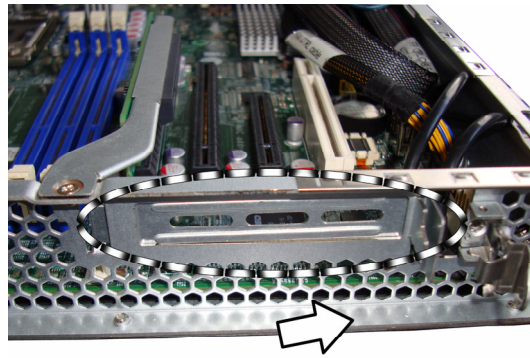
The GT20A-B7040 has **one preinstalled M2210-L8-1F** riser card,

You can install a PCI-E expansion card into the expansion slot which is available with riser card. The following instructions are for LAN card installation. You may refer to the procedures below for PCI-E installation.

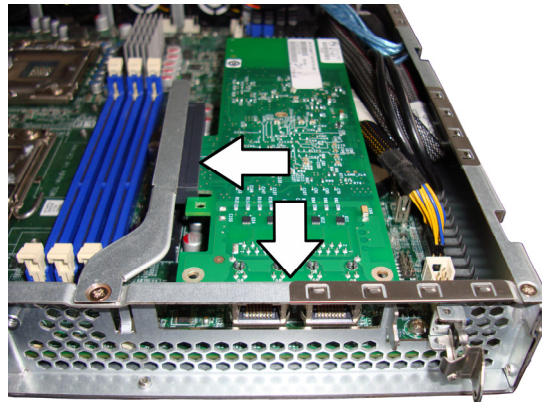
1. Push the tab of PCI slot on the rear panel in the direction as shown to release the bracket.



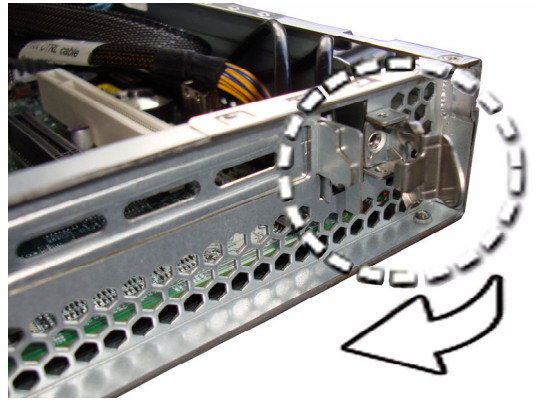
2. Move the bracket to the right direction as shown.



3. Insert the LAN card as shown.



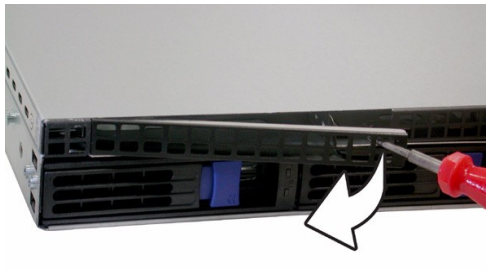
4. Push the tab of PCI slot in the direction as shown to fix the LAN card.



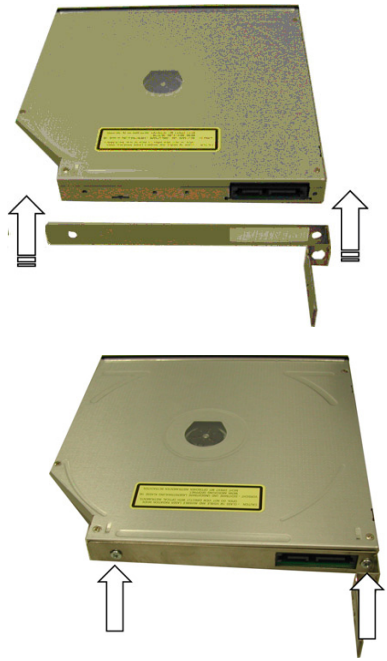
2.1.5 Installing the Slim SATA DVD-ROM

Follow these instructions to install the slim SATA DVD-ROM.

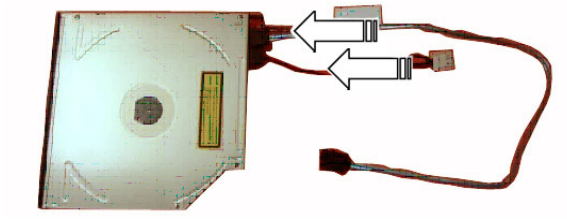
1. Use a screw driver to pull open the door of DVD-ROM drive bay in the direction as illustrated.



2. Place the DVD-ROM Bracket on the DVD-ROM. Secure the DVD-ROM bracket to DVD-ROM drive with 2 screws provided.

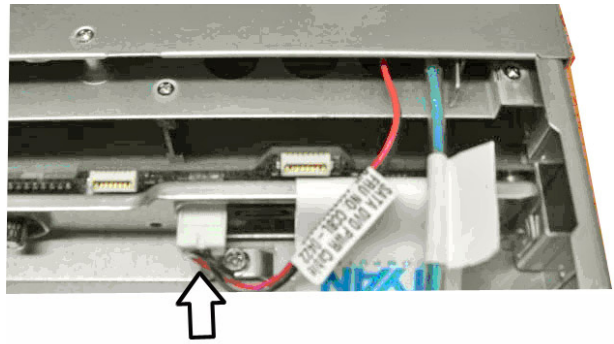


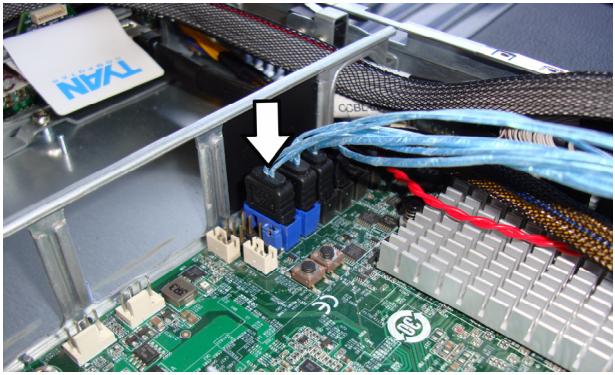
3. Connect the slim odd SATA cable and slim DVD SATA cables to the DVD-ROM drive.



3. Insert the DVD-ROM drive into the chassis.

4. Connect the slim odd SATA cable and DVD SATA cables.





NOTE: The DVD cable kit will not include in the box content with the DVD bracket kit. The DVD cable kit is in the package when you purchase the DVD-ROM drive.

2.2 Rack Mounting

CAUTION: Please note that the following illustrations are based standard barebones designs which may not look exactly like the rackmount server you purchased. Therefore, the illustrations should be held for your reference only.

After installing the necessary components, the TYAN GT20A-B7040 can be mounted in a rack using the supplied rack mounting kit.

Rack mounting kit
Sliding Rails x 2
Sliding Brackets x 4 (Front x 2, Rear x 2)
Mounting Ears (including screws) x 2
Screws Kit x 1
Mounting Brackets x 4

2.2.1 Installing the Server in a Rack

Follow these instructions to mount the TYAN GT20A-B7040 into an industry standard 19" rack.

NOTE: Before mounting the TYAN GT20A-B7040 in a rack, ensure that all internal components have been installed and that the unit has been fully tested.

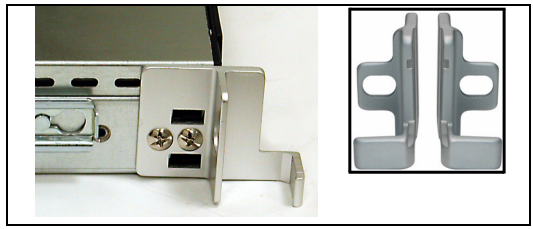
Screws List

No.	Screw	Size	Quantity
A		M4-4L	18
B		M5-8L	10
C		M5-15L	4

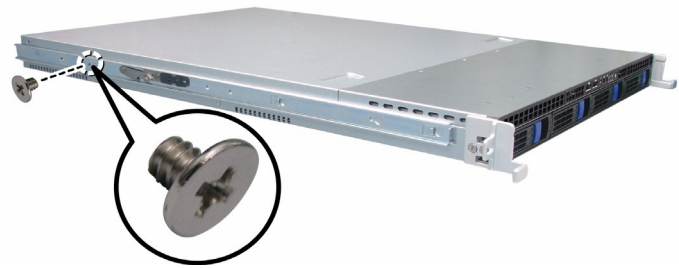
2.2.2 Installing the inner Rails to the Chassis

After installing the necessary components, the TYAN GT20A-B7040 can be mounted in a rack using the supplied rack mounting kit.

1. Screw the mounting ear to each side of TYAN GT20A-B7040 as shown. Please using screws from the supplied screws kit.

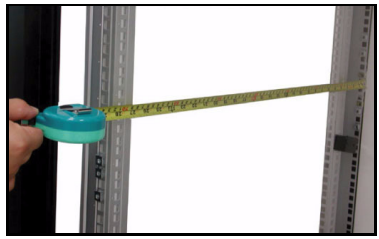


2. Draw out the inner rails from rail assembly. Install inner rails to left and right sides of chassis using 1 M4-4L(A) screw for each side.

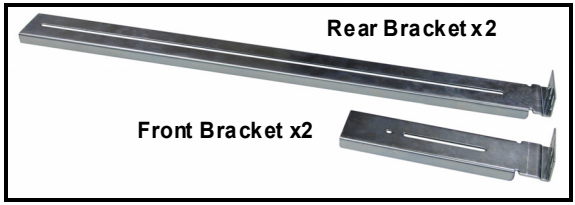


2.2.3 Installing the Outer Rails to the Rack

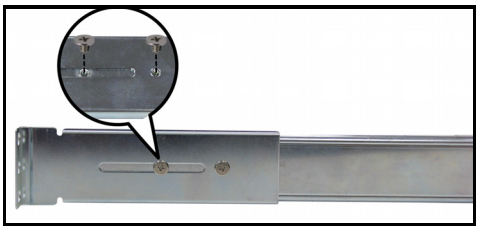
1 Measure the distance between inner side of the front and rear mounting brackets in the rack.



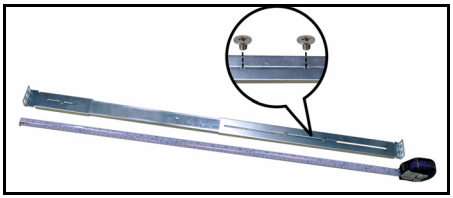
2 Locate the front and rear brackets.



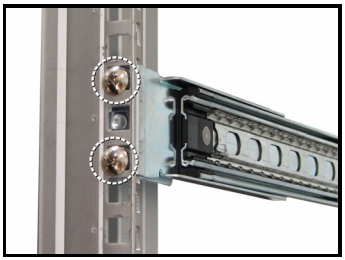
3 Secure the front bracket to outer rail with 2 M4-4L(A) screws.



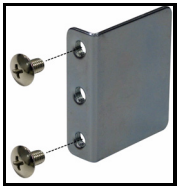
4 Reserve the distance same as in Step 2 on rear bracket. Secure the rear bracket to outer rail with 2 M4-4L(A) screws.



5. Secure the outer rail to the rack using 2 brackets and 4 M5-8L(B) screws for each side. Secure the mounting brackets from inside, not outside, of the rack.

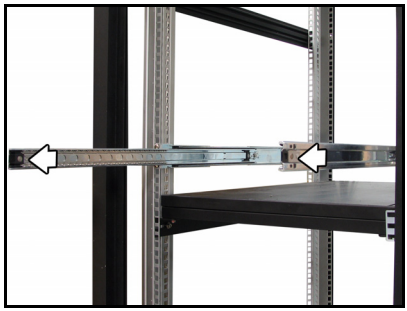


Mounting Bracket

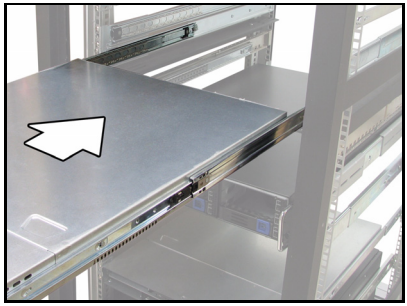


2.2.4 Rack mounting the Server

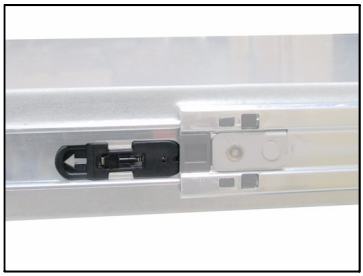
1 Draw out the middle rail to the latch position.

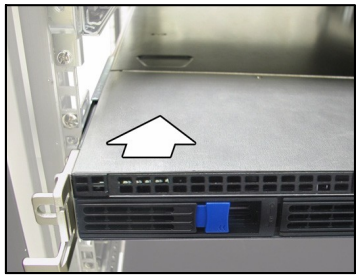


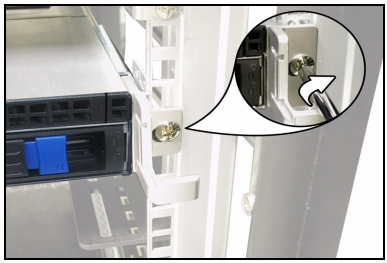
2 Lift the chassis and then insert the inner slide rails into the middle rails.



3 Push the chassis in and press the latch key (A). Then push the whole system into the rack (B)







4 Secure the mounting ears of chassis to the rack with 2 M5-15L(C) screws.

NOTE: To avoid injury, it is strongly recommended that two people lift the TYAN GT20A-B7040 into the place while a third person screws it to the rack.

NOTE

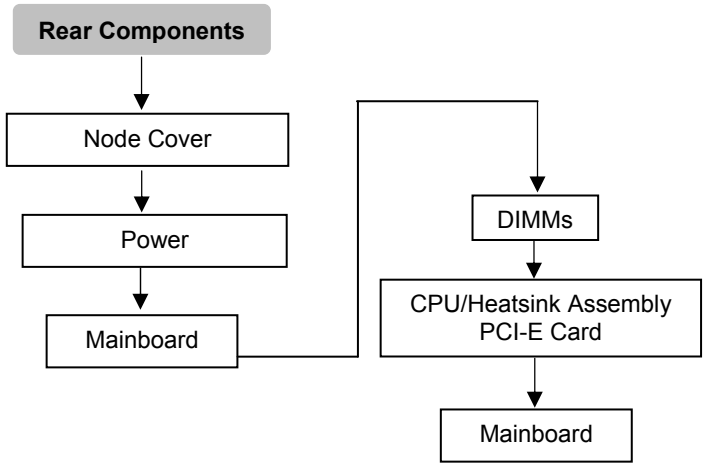
Chapter 3: Replacing Pre-Installed Components

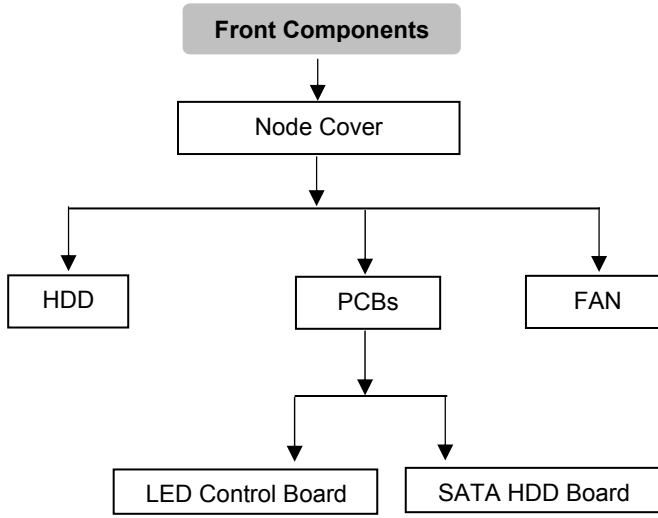
3.0.1 Introduction

This chapter explains how to replace the pre-installed components, including the Motherboard, LED control board, SATA HDD board, M2210-L8-1F PCI-E Riser card, System fans, and Power supply unit etc.

3.0.2 Disassembly Flowchart

The following flowchart outlines the disassembly procedure.




Front Components
Node Cover
HDD
PCBs
FAN
LED Control Board
SATA HDD Board

3.1 Removing the Cover

Before replacing any parts you must remove the chassis cover. Follow Section **2.1.1 Removing the Chassis Cover** (page 31) to remove the cover of the GT20A-B7040.

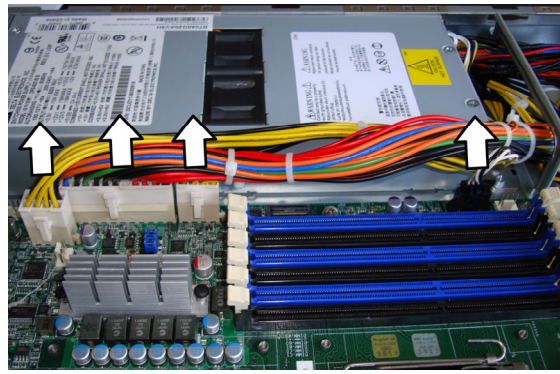
3.2 Removing Motherboard Procedures

Follow these instructions to replace the motherboard.

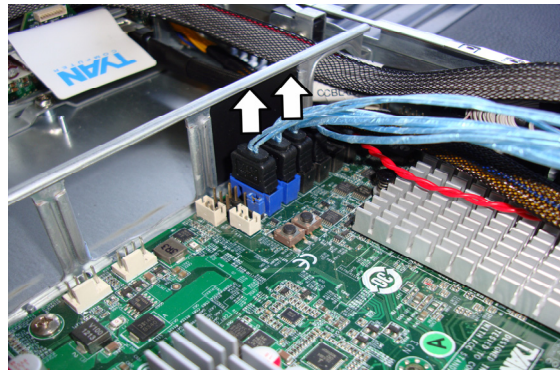
3.2.1 Disconnecting All Motherboard Cables

Before replacing the motherboard or certain components, remove cables connected to the motherboard. Follow these instructions to remove all motherboard cables.

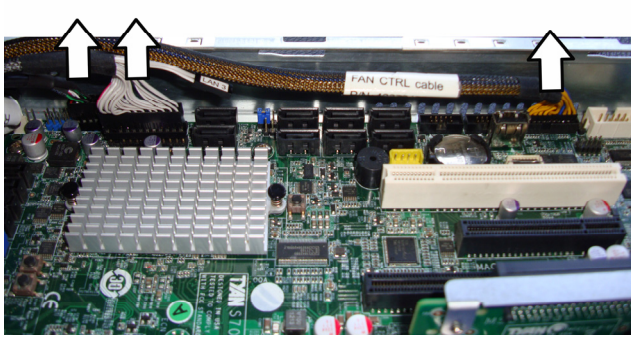
1. Disconnect the 24-pin power cable, 8-pin power cables and PSMI cable.



2. Disconnect the 4 SATA cables.



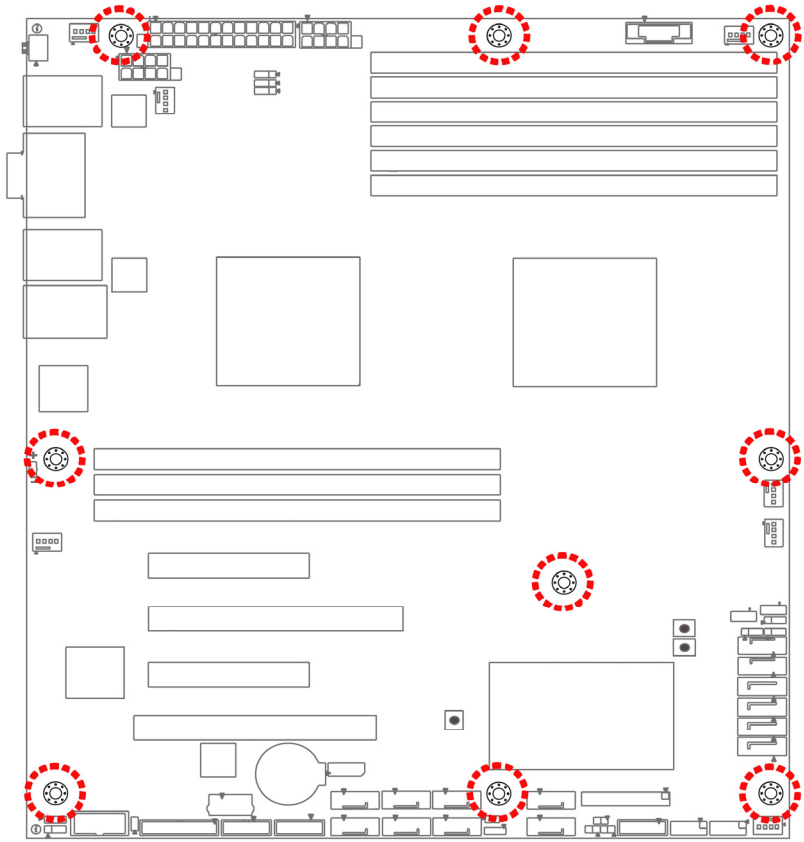
3. Disconnect the front panel, SGPIO and USB cables.



3.2.2 Removing the Motherboard

After removing all of the aforementioned cables, follow the instructions below to remove the motherboard from the chassis.

1. Remove the heatsink and processor if installed.
2. Remove the nine screws securing the motherboard to the chassis.

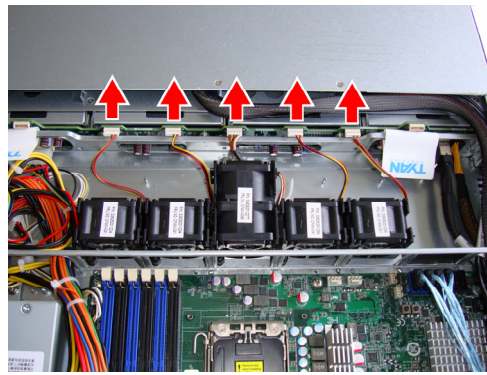


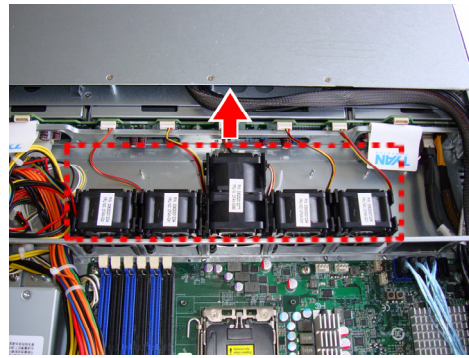
3. Carefully lift the motherboard from the chassis.

3.3 Replacing the System Fan

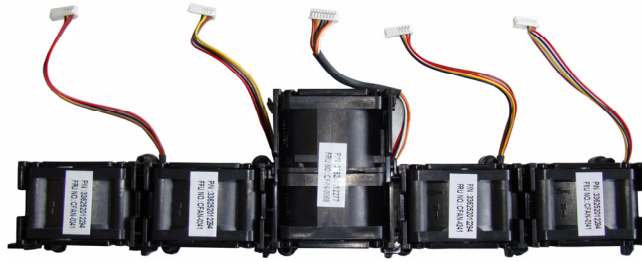
Follow these instructions to replace the cooling fans in your system.

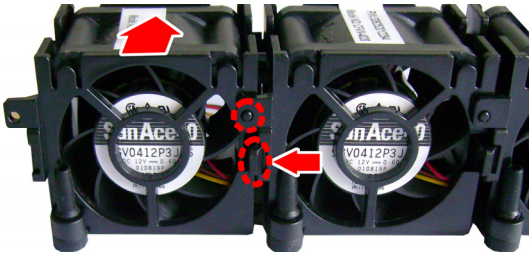
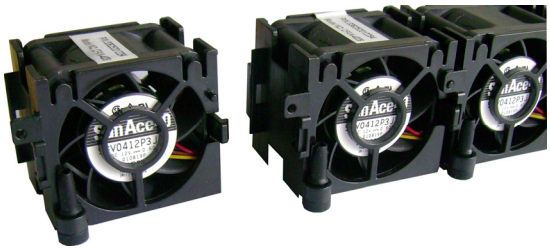
1. Locate the cooling fans in your system.
2. Unplug the cables connected to the mainboard and lift the fan unit up from the chassis.



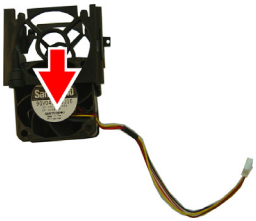
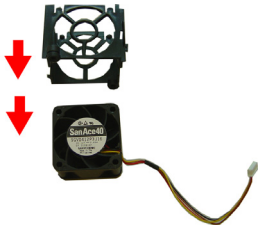
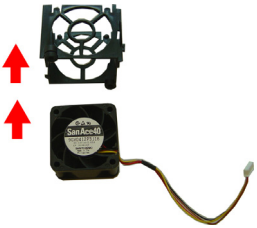


3. Follow Step A & B to unlock the fans.

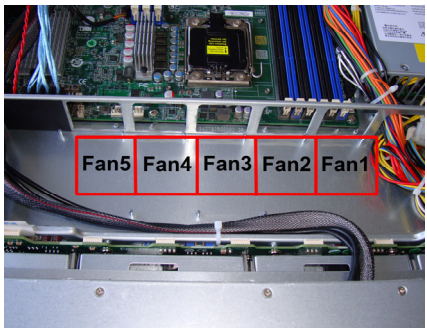


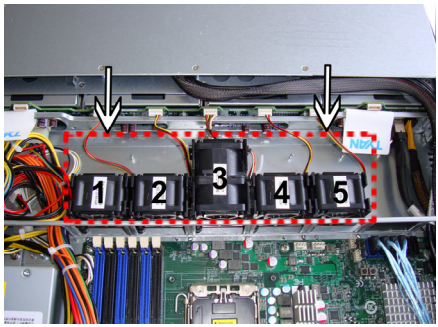
40x28mm Fan Step A	
Step B	

4. Follow Step C & D to take out the old fan and replace with a new one.

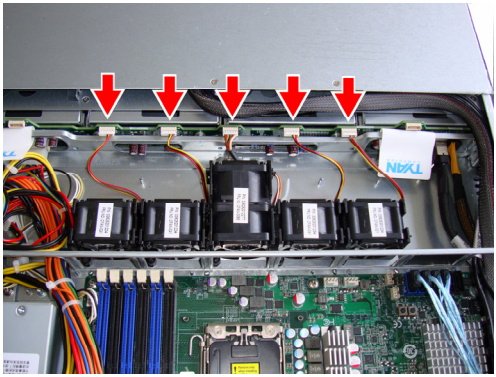
40x28mm Fan Step C		
Step D		

5. After replacing the new fans, follow Step A & B in reverse order to lock the fans. Reinstall the fans into the chassis.





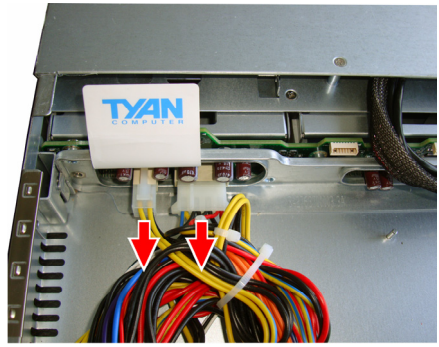
6. Connect the fan cables to the backplane fan connectors.



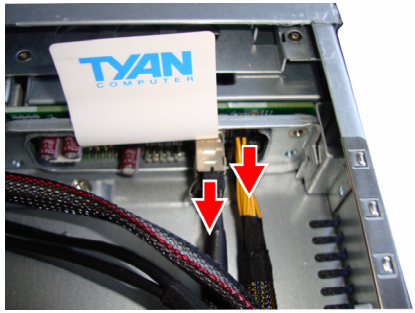
System Fan to M1235		
System Fan	**Connect to**	**M1235**
Fan1	→	Fan1
Fan2	→	Fan2
Fan3	→	Fan3
Fan4	→	Fan4
Fan5	→	Fan5

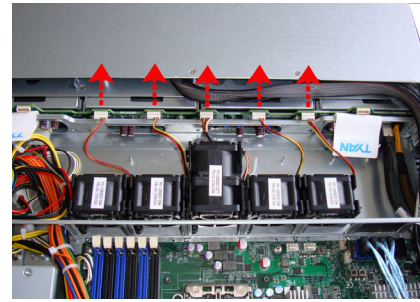
3.4 Replacing the M1235 HDD Backplane

1. Disconnect the power cables connected to the HDD Backplane.

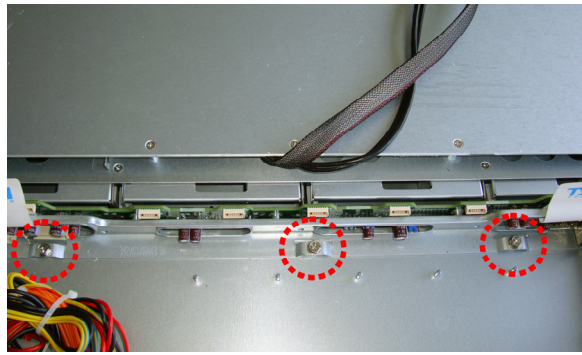


2. Disconnect the Mini SAS cable, control cable and the fan cables.

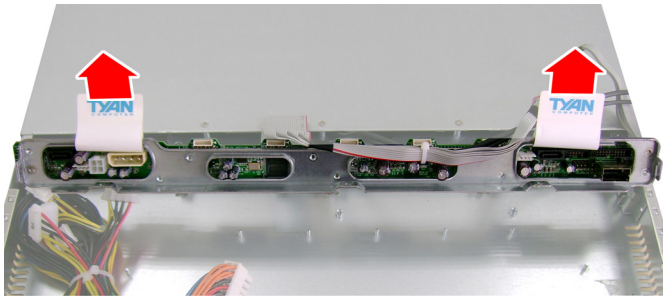




3. Remove the three screws securing the bracket to the chassis base.



4. Lift the bracket up from the chassis.



5. Unscrew the HDD Backplane from the bracket.

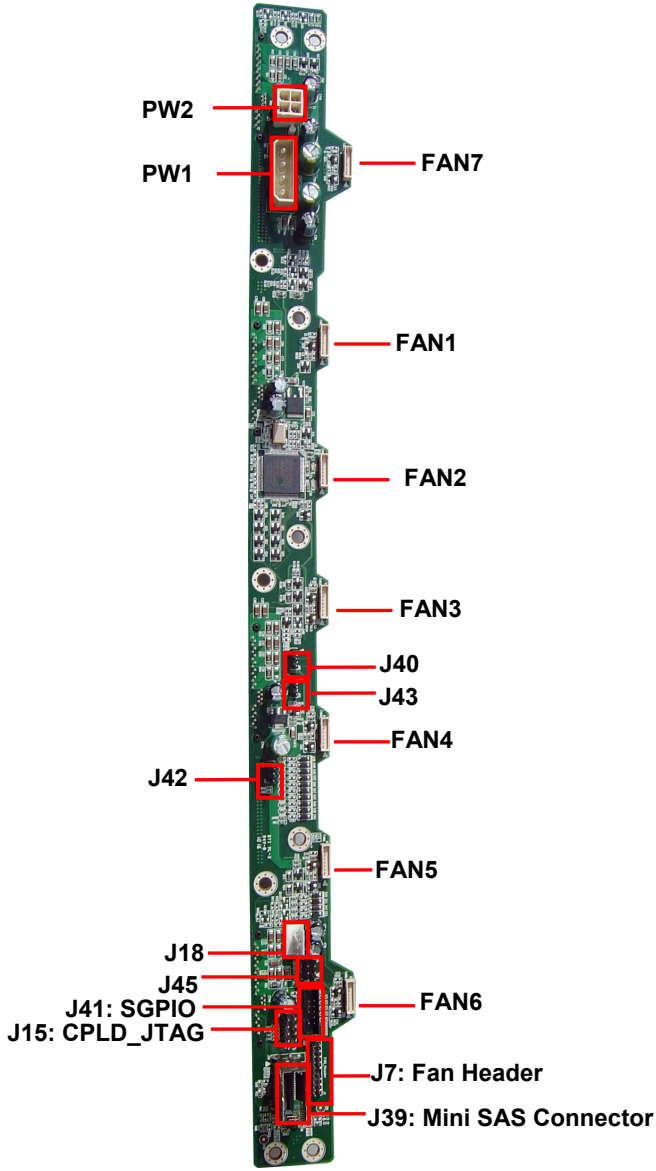
6. Replace a new HDD Backplane and reinstall it into the chassis following the steps mentioned earlier in reverse.

M1235 SATA/SAS Backplane to S7040			
Cable	**SATA/SAS BP Board**	**Connect to**	**S7040 MB**
Mini-SAS Cable	J39	→	SATA1~SATA4 SGPIO2

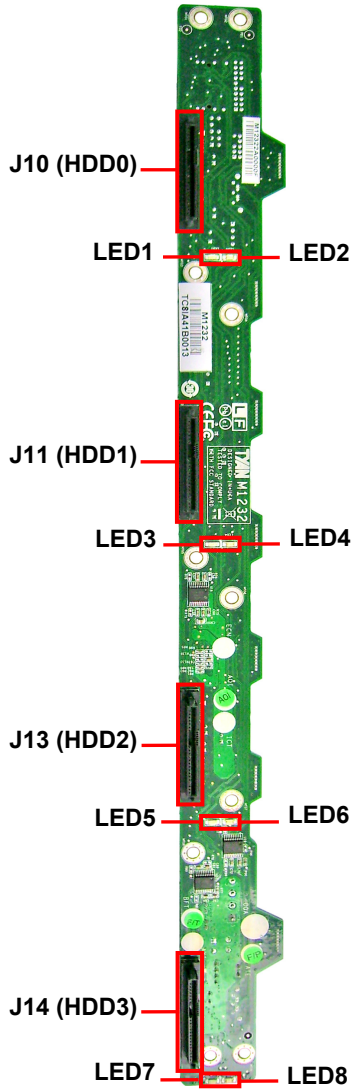
M1235 SATA/SAS Backplane to S7040			
Cable	**SATA/SAS BP Board**	**Connect to**	**S7040 MB**
Fan Cable	J7	→	FAN_HDR1

3.4.1 M1235 HDD Backplane Features

M1235 Front View



M1235 Rear View



3.4.2 M1235 Connector Pin Definitions

PW1

Pin	1	2	3	4
Definition	+12V	GND	GND	+5V

PW2

Definition	Pin	Pin	Definition
GND	1	2	GND
+12V	3	4	+12V

J15 SGPIO JTAG

Definition	Pin	Pin	Definition
TCK	1	2	GND
TDO	3	4	3.3V
TMS	5	6	NI
NI	7	8	KEY
TDI	9	10	GND

J41 SGPIO for IOH

Definition	Pin	Pin	Definition
SM_CLK	1	2	SGPIO_0
SM_DATA	3	4	SGPIO_1
GND	5	6	SGPIO_2
KEY	7	8	SGPIO_3
NI	9	10	HD_ERR_LED

J18 Slim CDROM power

Pin	1	2	3	4
Definition	+12V	GND	GND	+5V

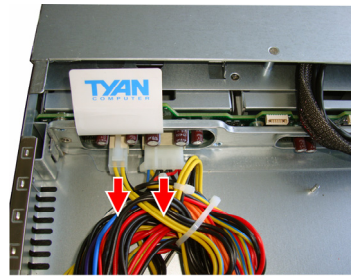
J40 PWM select for system FAN3

Pin	Definition
1	CPU_PWM
2	PWM_12(FAN3)
3	CPU_PWM2
Note： Pin 1-2 chose by CPU_PWM (Default) Pin 2-3 chose by CPU_PWM2	

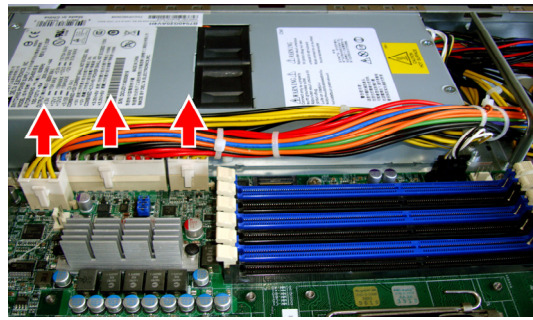
3.5 Replacing the Power Supply

Replace the power supply unit:

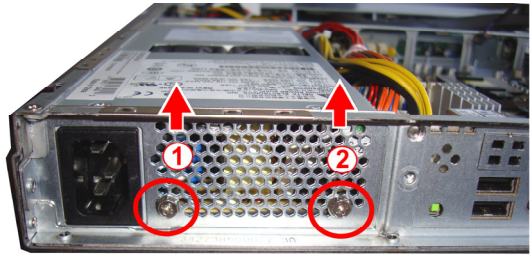
1. Disconnect the power cables from the motherboard and the M1235.

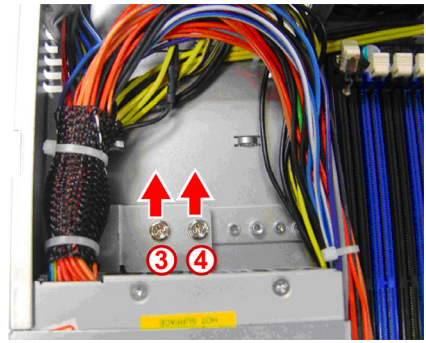


PSU to M1235 Backplane (BP) Board		
PSU	**Connect to**	**M1235**
2x2P P3	→	PW2
B4P P4	→	PW1

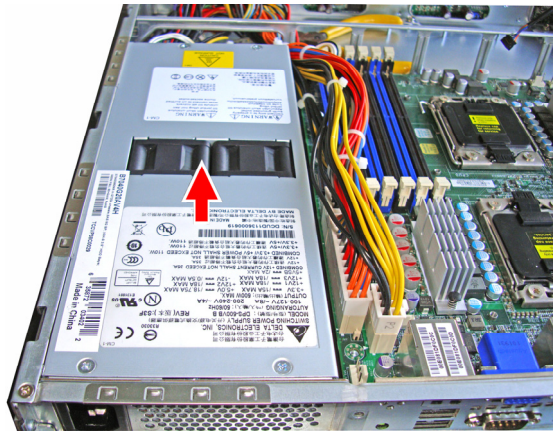


2. Remove four (4) screws that secure the power supply to the chassis.





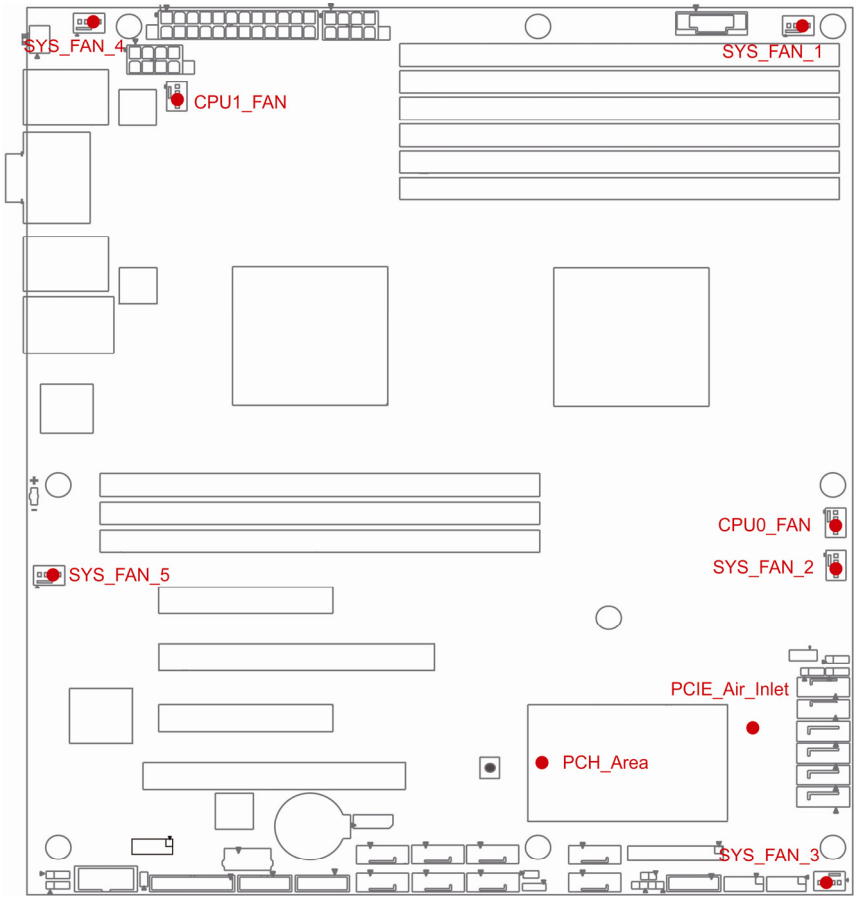
3. Lift the whole power supply unit up.



4. Install a new power supply unit following the steps in reverse.

Appendix I: Fan and Temp Sensors

This section aims to help readers identify the locations of some specific FAN and Temp Sensors on the motherboard. A table of BIOS Temp sensor name explanation is also included for readers' reference.



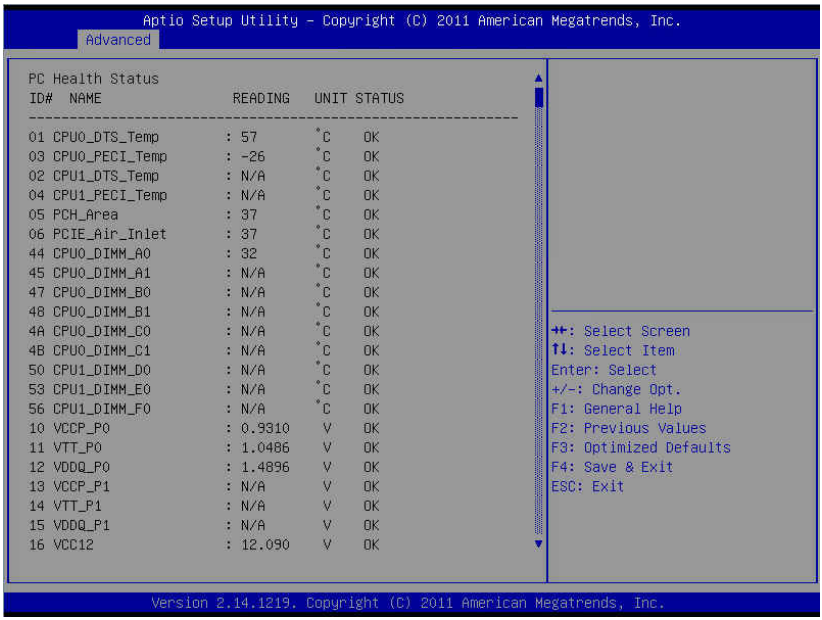
NOTE: The red dot indicates the location of the sensors.

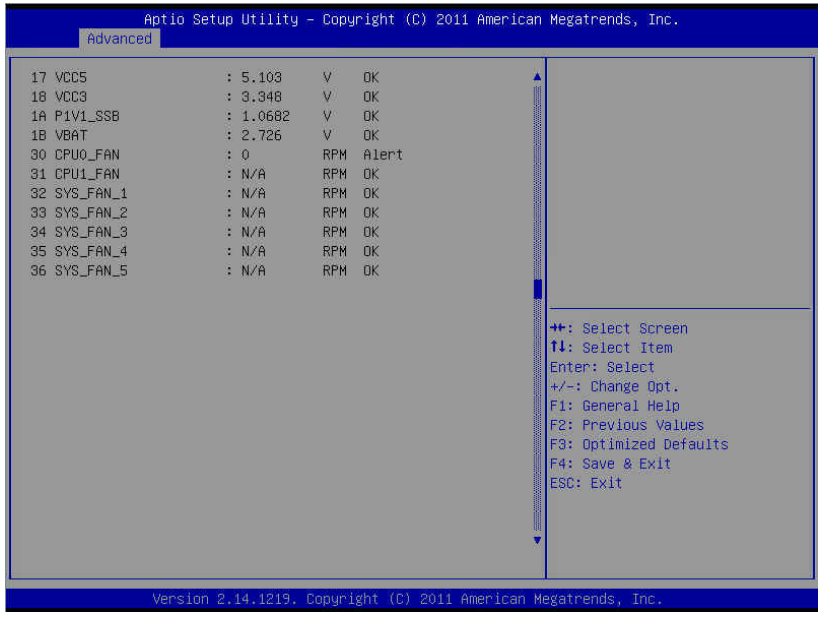
Fan and Temp Sensor Location:

1. Fan Sensor: It is located in the third pin of the fan connector, which detects the fan speed (rpm)
2. Temp Sensor: **PCH_Area** and **PCIE_Air_Inlet.** They detect the system temperature around.
   NOTE: The system temperature is measured in a scale defined by **Intel**, not in Fahrenheit or Celsius.

BIOS Temp Sensor Name Explanation:

BIOS Temp Sensor	Name Explanation
CPU0_DTS_Temp	Temperature of the CPU0 Digital Temperature Sensor
CPU0_PECI_Temp	Temperature of the CPU0 Platform Environment Control Interface
CPU1_DTS_Temp	Temperature of the CPU1 Digital Temperature Sensor
CPU1_PECI_Temp	Temperature of the CPU1 Platform Environment Control Interface
PCH_Area	Temperature of the PCH Area
PCIE_Air_Inlet	Temperature of the PCIE Air Inlet Area
CPU0_DIMM_A0	Temperature of CPU0 DIMM A0 Slot
CPU0_DIMM_A1	Temperature of CPU0 DIMM A1 Slot
CPU0_DIMM_B0	Temperature of CPU0 DIMM B0 Slot
CPU0_DIMM_B1	Temperature of CPU0 DIMM B1 Slot
CPU0_DIMM_C0	Temperature of CPU0 DIMM C0 Slot
CPU0_DIMM_C1	Temperature of CPU0 DIMM C1 Slot
CPU1_DIMM_D0	Temperature of CPU1 DIMM D0 Slot
CPU1_DIMM_E0	Temperature of CPU1 DIMM E0 Slot
CPU1_DIMM_F0	Temperature of CPU1 DIMM F0 Slot
BIOS Fan Sensor	**Name Explanation**
CPU0_FAN	Fan speed of CPU0_FAN
CPU1_FAN	Fan speed of CPU1_FAN
SYS_FAN_1	Fan speed of SYS_FAN_1
SYS_FAN_2	Fan speed of SYS_FAN_2
SYS_FAN_3	Fan speed of SYS_FAN_3
SYS_FAN_4	Fan speed of SYS_FAN_4
SYS_FAN_5	Fan speed of SYS_FAN_5


Aptio Setup Utility – Copyright (C) 2011 American Megatrends, Inc.
Advanced
PC Health Status
ID# NAME READING UNIT STATUS
01 CPU0_DTS_Temp : 57 °C OK
03 CPU0_PECI_Temp : -26 °C OK
02 CPU1_DTS_Temp : N/A °C OK
04 CPU1_PECI_Temp : N/A °C OK
05 PCH_Area : 37 °C OK
06 PCIE_Air_Inlet : 37 °C OK
44 CPU0_DIMM_A0 : 32 °C OK
45 CPU0_DIMM_A1 : N/A °C OK
47 CPU0_DIMM_B0 : N/A °C OK
48 CPU0_DIMM_B1 : N/A °C OK
4A CPU0_DIMM_C0 : N/A °C OK
4B CPU0_DIMM_C1 : N/A °C OK
50 CPU1_DIMM_D0 : N/A °C OK
53 CPU1_DIMM_E0 : N/A °C OK
56 CPU1_DIMM_F0 : N/A °C OK
10 VCCP_P0 : 0.9310 V OK
11 VTT_P0 : 1.0486 V OK
12 VDDQ_P0 : 1.4896 V OK
13 VCCP_P1 : N/A V OK
14 VTT_P1 : N/A V OK
15 VDDQ_P1 : N/A V OK
16 VCC12 : 12.090 V OK
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit
Version 2.14.1219. Copyright (C) 2011 American Megatrends, Inc.


Aptio Setup Utility – Copyright (C) 2011 American Megatrends, Inc.
Advanced
17 VCC5 : 5.103 V OK
18 VCC3 : 3.348 V OK
1A P1V1_SSB : 1.0682 V OK
1B VBAT : 2.726 V OK
30 CPU0_FAN : 0 RPM Alert
31 CPU1_FAN : N/A RPM OK
32 SYS_FAN_1 : N/A RPM OK
33 SYS_FAN_2 : N/A RPM OK
34 SYS_FAN_3 : N/A RPM OK
35 SYS_FAN_4 : N/A RPM OK
36 SYS_FAN_5 : N/A RPM OK
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit
Version 2.14.1219. Copyright (C) 2011 American Megatrends, Inc.

NOTE

Appendix II: Cable Connection Tables

1. System Fan Connector

System Fan to M1235 Backplane (BP) Board		
System Fan	Connect to	M1235
Fan1	→	FAN1
Fan2	→	FAN2
Fan3	→	FAN3
Fan4	→	FAN4
Fan5	→	FAN5

2. SATA HDD Cable

M1235 SATA/SAS Backplane (BP) Board to S7040 MB			
Cable	M1235	Connect to	S7040 MB
Mini-SAS Cable	J39	→	SATA1~SATA4 SGPIO2
Fan cable	J7	→	FAN_HDR1

3. Control Cable and USB Cable

M1008 LED Control Board to S7040 MB			
	M1008	Connect to	S7040 MB
Control Cable	J3	→	J30
USB Cable	J1	→	J25

4. Power Supply Cables

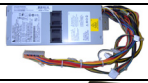
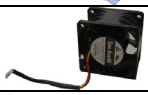
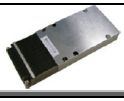
PSU to S7040 MB		
500W PSU	Connect to	S7040 MB
2x12P P1	→	PWR3
2x4P P2	→	PWR2
2x4P P7	→	PWR1
PSMI P8	→	J29

PSU to M1235 BP BD		
500W PSU	Connect to	M1235
2x2P P3	→	PW2
B4P P4	→	PW1

5. Chassis Intrusion Cable

Chassis Intrusion Cable		
Chassis	Connect to	S7040 MB
Intrusion Cable	→	J33

Appendix III: FRU Parts Table

GT20A-B7040 FRU Parts				
Item	**Model Number**	**Part Number**	**Picture**	**Description**
PCBA	M2210-L8-1F	411T47600010		M2210-L8-1F for GT20A
Cable	CCBL-067P	422782700006		Mini-SAS cable
	CCBL-0317	332810000397		A/C Power Cord, L=1800mm, US type
	CCBL-0300	332810000281		A/C Power Cord, L=1830mm, EU type
Power Supply	CPSU-0520	471100000059		Delta,DPS-500VB B (S3F),500W
FAN	CFAN-0241	336252012294		40*40*28 MM
	CFAN-0068	336252012277		40*40*56 MM
Rack Mounting Kit	FRU-AS-0020	452T15200002		TF-SLIDE RAIL KIT;SBU,COMPX FOR GT20,KGT20
CPU Heatsink	CHSK-0370	343782700001		1U-PASSIVE-HEATSINK SQ40400002,90X90X27MM,SCREW

NOTE

Appendix IV: Technical Support

If a problem arises with your system, you should first turn to your dealer for direct support. Your system has most likely been configured or designed by them and they should have the best idea of what hardware and software your system contains. Hence, they should be of the most assistance for you. Furthermore, if you purchased your system from a dealer near you, take the system to them directly to have it serviced instead of attempting to do so yourself (which can have expensive consequence).

If these options are not available for you then MiTAC International Corporation can help. Besides designing innovative and quality products for over a decade, MiTAC has continuously offered customers service beyond their expectations. TYAN's website (http://www.tyan.com) provides easy-to-access resources such as in-depth Linux Online Support sections with downloadable Linux drivers and comprehensive compatibility reports for chassis, memory and much more. With all these convenient resources just a few keystrokes away, users can easily find their latest software and operating system components to keep their systems running as powerful and productive as possible. MiTAC also ranks high for its commitment to fast and friendly customer support through email. By offering plenty of options for users, MiTAC serves multiple market segments with the industry's most competitive services to support them.

TYAN's tech support is some of the most impressive we've seen, with great response time and exceptional organization in general." — Anandtech.com

Please feel free to contact us directly for this service at tech-support@tyan.com

Help Resources:

1. See the TYAN's website for FAQ's, bulletins, driver updates, and other information: http://www.tyan.com
2. Contact your dealer for help before calling TYAN.
3. Check the TYAN user group: alt.comp.periphs.mainboard.TYAN

Returning Merchandise for Service

During the warranty period, contact your distributor or system vendor FIRST for any product problems. This warranty only covers normal customer use and does not cover damages incurred during shipping or failure due to the alteration, misuse, abuse, or improper maintenance of products.

Note:

A receipt or copy of your invoice marked with the date of purchase is required before any warranty service can be rendered. You may obtain service by calling the manufacturer for a Return Merchandise Authorization (RMA) number. The RMA number should be prominently displayed on the outside of the shipping carton and the package should be mailed prepaid.

TYAN will pay to have the board shipped back to you.

TYAN® GT20A-B7040 Service Engineer's Manual V1.0

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